

REMARKS

The Office Action dated March 1, 2010, has been received and carefully noted. The following remarks are submitted as a full and complete response thereto.

Claims 1-7 are currently pending in the application, of which claim 1 is an independent claim. Claims 1-7 are respectfully submitted for consideration.

At page 2, item 2, the Office Action stated that the rejection of all the pending claims based on U.S. Patent No. 6,920,374 of Takenaka *et al.* ("Takenaka '374") is being "maintained." This rejection is respectfully traversed.

Takenaka '374 is not able to be cited under 35 U.S.C. 102(e), because Takenaka '374 is a national stage application of a published international application, which was not in English. Thus, Takenaka '374 cannot be cited under 35 U.S.C. 102(e) against any patent application.

In the Office Action of September 14, 2009, as clarified by the Interview conducted September 24, 2009, Takenaka '374 had been replaced by U.S. Patent No. 6,243,623 of Takenaka *et al.* ("Takenaka '623"), apparently to address the problem that Takenaka '374 cannot be cited under 35 U.S.C. 102(e). However, the present Office Action seems to have continued the same error that was made in the Office Action of September 14, 2009 (prior to the clarification), as well as in the Office Action of March 23, 2009.

The official summary of the Interview conducted September 24, 2009, indicated on the record that Takenaka '374 is not proper prior art. Therefore, it is respectfully

submitted that the rejection based on Takenaka '374 is completely unjust, especially given that the rejection based on Takenaka '374 had been already previously withdrawn.

To obtain clarification whether Takenaka '374 was really the intended basis of the rejection, Applicants' representative contacted the Examiner by telephone in March. The Examiner confirmed that Takenaka '374 is the basis for the rejection, and specifically that claims 1-7 have been rejected under 35 U.S.C. 102(e) as being anticipated by Takenaka '374. Applicants' representative further inquired why the rejection was being proposed based on a reference that has been repeatedly shown not to be prior art. The Examiner insisted that Applicants' only option is to file a response to the outstanding Office Action.

Since such a solution does not seem just, Applicants' representative immediately additionally contacted the Examiner's supervisor. The Examiner's supervisor responded much more positively. Indeed, the Examiner's supervisor indicated that he would see to it that some further action was taken from the Examiner's side on this matter. The Examiner's supervisor indicated that a new Office Action or Notice of Allowance would be mailed within about one week. However, after about a month had passed, there was still no new Office Action. Applicants' representative, therefore, further contacted the Group Director, who also suggested that the safest approach would be submit a written response. Subsequently, the Examiner's supervisor again contacted Applicants' representative and indicated that a new Office Action or Notice of Allowance would be forthcoming. However, to date no new Office Action has been received.

However, even if the rejection were to be amended to be substitute some other document with the same disclosure as Takenaka '374, the rejection would still be manifestly improper, for at least the following reasons.

Takenaka '374 generally relates to a floor shape estimation system of a legged mobile robot, in particular a biped walking robot. The system estimates a floor shape, more specifically a foot-to-foot floor inclination difference based on at least a control error of the total floor reaction force's moment and based on the estimated value. The system also corrects a feet compensating angle based on the estimated value. Further, the system estimates a floor shape, namely a foot floor inclination difference, based on at least a control error of the foot floor reaction force about a desired foot floor reaction force central point. The system additionally corrects a foot compensating angle based on the estimated value. The system can provide an estimate of the shape of a floor with which the robot is in contact. If the floor shape is different from what was expected, the system can produce a floor reaction force as desired by absorbing the influence of the difference between the expected and actual shape.

In contrast to Takenaka '374, claim 1 of the present application recites that the "center of the second joint is offset against a position in a plane view." Because of this offset, "a center of the floor reaction force detector is closer to the position than to the center of the second joint in a plane view" (claim 1, lines 13-15).

Takenaka '374 cannot disclose the above-quoted feature of claim 1, because Fig. 2 of Takenaka '374 illustrates that that the center of joint 18R(L) is in line with a center

point of a force sensor 44, which is in line with the center point of the foot. Because the center of joint 18R(L) of Takenaka '374 is in line with the center point of the foot, the center of joint 18R(L) cannot be interpreted to be offset against the center point of the foot. In other words, the center of joint 18R(L) in Takenaka '374 cannot "offset against a position ... [whose] distance to a remotest point of at least one ground area becomes minimum." See, for example, claim 1, lines 10-12. Because center of joint 18R(L) in Takenaka '374 is not offset against the center point of the foot, Takenaka '374 cannot disclose that "a center of the floor reaction force detector is closer to the position than to the center of the second joint in a plane view."

Furthermore, the Office Action relied primarily on the Figures in Takenaka '374 to disclose the above-quoted features. However, the description related to the Figures in Takenaka '374 is silent as to the particular alignment of the ankle joints 18R(L), sensor 44, and the foot, and consequently Takenaka '374 cannot be relied on to disclose the above-quoted features of claim 1. For example, the description of Takenaka '374 in support of Fig. 2, for example, does not disclose how "a center of the second joint is offset against a position." Without such corresponding description in Takenaka '374, the figures of Takenaka '374 are insufficient to anticipate such features, since there is not, for example, any indication that the figures are drawn to scale. Therefore, the drawings in Takenaka '374 alone cannot be relied on to anticipate the above-quoted features of claim 1.

Furthermore, even if Fig. 2 of Takenaka '374 were measured by an eye in a side view, the center of a second (ankle) joint of Takenaka '374 would be interpreted to be in line with the center of the floor reaction force detector (and the position). Therefore, as discussed above, Takenaka '374 cannot disclose "a center of the floor reaction force detector [being] closer to the position than to the center of the second joint in a plane view," because the center of joint 18R(L) of Takenaka '374 is in line with a center point of a force sensor 44.

Under U.S. Patent Law, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." (See MPEP § 2131, citing to *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)). Further, U.S. Patent Law requires that "[t]he elements must be arranged as required by the claim..." *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). Because Takenaka '374 does not disclose each and every element as required by claim 1, the Office Action fails to establish that claim 1 is anticipated by Takenaka '374.

Similar distinctions to those identified above were presented with respect to Takenaka '623 in the Response filed November 24, 2009. The same analysis also applies to Figure 2 of Takenaka '623, which is the same as Figure 2 of Takenaka '374, with respect to the issues discussed above. Takenaka '623 was cited in the previous Office Action because Takenaka '623 published in 2001, and consequently may be cited under 35 U.S.C. 102(b) against the present application. Thus, Applicants respectfully note that

the above technical distinctions also exist with respect to Takenaka '623, in order to expedite prosecution of the application.

The Office Action responded to the distinctions presented above with respect to “offset against a position ... [whose] distance to a remotest point of at least one ground area becomes minimum,” by alleging that these features are taught by Takenaka '374 at column 13, lines 41-50. The Office Action argued “as to having ground area has been interpreted broadly with respect to the walking distance from predetermined departure to arrival.”

This argument in the Office Action is confusing. The equation cited by the Office Action mentions a distance between a desired first foot reaction force central point and a desired second foot reaction force central point. However, this distance corresponds to a distance desired between two different feet. Additionally, the equation mentions a distance between the individual foot reaction force central points and a desired zero moment point (ZMP). This distance corresponds to the distance between one of the feet and the “total floor reaction force central point” as explained at column 14, lines 3-8, of Takenaka '374. Neither of these distances correspond to “a position ... [whose] distance to a remotest point of at least one ground area becomes minimum.” Furthermore, while the equation mentions various distances and central points, the equation does not indicate their relation in plane view. Accordingly, the citation of column 13, lines 41-50, of Takenaka '374 cannot remedy the deficiencies of the rejection.

Additionally, the meaning of “ground area” is **not** open to broad interpretation, as this term is defined in the present application’s specification. Paragraph [0003] of the present application explains: “The center of the ankle joint is offset (bias) backward and inward to the bottom surface, i.e. ground area, to be grounded on a floor surface.” Thus, the “ground area” must be interpreted as the bottom surface of the foot to be grounded on a floor surface. It appears that the Office Action has mistakenly interpreted “ground area” to refer to a stride distance of the bipedal robot. Such an interpretation is incorrect and is ruled out by the explicit definition of “ground area” provided in the present application’s specification.

The Office Action responded to the distinctions presented above with respect to “a center of the floor reaction force detector is closer to the position than to the center of the second joint in a plane view,” by alleging that these features are taught by Takenaka ‘374 at Figure 4, element 108, Figure 2, “particularly the ‘foot floor reaction force’” and column 12, lines 51-61, and “again particularly ‘an actual foot floor reaction force detector’.” The Office Action noted that Figure 2 of Takenaka ‘374 is “an explanatory side view showing the structure of the foot of a biped robot.”

While Figure 2 of Takenaka ‘374 may be “an explanatory side view showing the structure of the foot of a biped robot,” and while it can be understood how the “actual foot floor reaction force detector” of Takenaka ‘374 is being alleged to correspond to the recited “floor reaction force detector,” the Office Action’s response seems to have completely missed any disclosure allegedly corresponding to “is closer to the position

than to the center of the second joint.” As explained above, this feature related to the relative position of the detector and the joint is absent from Takenaka ‘374. Thus, Takenaka ‘374 cannot anticipate the features of claim 1, or of the claims that depend from it, even if Figure 2 is a plane view and even if the “actual foot floor reaction force detector” were to correspond to the recited “floor reaction force detector.” Thus, the rejection cannot be supported by the comments included in the “Response to Arguments” section of the Office Action (page 5 thereof).

Applicants respectfully encourage the Examiner to compare Figure 7 of the present application (including force sensor 52 and ankle joints 15,16) to Figure 2 of Takenaka ‘374. It is easy to see how a center of ankle joints 15,16 are offset in plane view from a center of sensor 52. In contrast, Figure 2 of Takenaka ‘374 appears on its face to show joint 18R (L) directly above sensor 34, without any visible offset in the plane view. Furthermore, the written description of Takenaka ‘374 does not indicate that any such offset exists. Accordingly, the rejection cannot be properly maintained.

For the reasons set forth above, it is respectfully submitted that each of claims 1-7 recites subject matter that is neither disclosed nor suggested in the cited art and that the cited art is not prior art. It is, therefore, respectfully requested that the rejection of claims 1-7 be withdrawn, and that this application be passed to issuance.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by

telephone, Applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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